

Case Report

Bilateral Acute Onset Myopia and Angle Closure Glaucoma after Oral Topiramate: A Case Report

Sumalee Boonyaleephan MD*

* Department of Ophthalmology, Faculty of Medicine, Srinakharinwirot University, Nakhon Nayok

Objective: Describe bilateral acute onset myopia and angle-closure glaucoma as ocular adverse effects of topiramate.

Case Report: A 23 year-old woman developed bilateral severe blurred vision seven days after initiating therapy with topiramate. Her visual acuity was counting fingers in both eyes. Intraocular pressures were 33 mmHg and 32 mmHg in the right and left eyes, respectively, with conjunctival chemosis, corneal edema, shallow anterior chambers, and closed angles. Her refraction was -7.50 diopters in both eyes. The symptoms and clinical findings resolved completely upon discontinuation of topiramate and administration of antiglaucoma drugs.

Conclusion: Topiramate use can result in acute bilateral angle-closure glaucoma and myopia, which are usually reversible upon cessation of the drug. Visual outcome is usually good and the episode resolves within a few weeks. Thus, it is important for clinicians to recognize these conditions and educate patients about these serious adverse effects when prescribing topiramate.

Keywords: Topiramate, acute myopia, acute angle-closure glaucoma

J Med Assoc Thai 2008; 91 (12): 1904-8

Full text. e-Journal: <http://www.medassocthai.org/journal>

Topiramate (Topamax® Jansen Ortho Inc.), an anti-epileptic sulfamate-derived drug has been widely used. However, there has been recent indication of migraine prophylaxis. Banta et al⁽¹⁾ reported the first case of topiramate induced acute-angle closure glaucoma in a 51 year-old man who recently initiated the medication for mood-stabilization. Acute myopia and acute angle-closure glaucoma are serious rare side-effects of the drug. Several clinicians are not aware of these conditions when the patients receive a low dose of oral topiramate. Thus, the present report may increase clinicians' awareness of the serious side effects of a low dose of topiramate.

Case Report

A 23-year-old woman presented with a history of migraines. Her medications included amitriptyline,

mefenamic acid, and propranolol. She started oral topiramate 25 mg daily for migraine prophylaxis. Seven days later, she complained of acute blurred vision and ocular pain in both her eyes. Visual acuity decreased to where she could only count fingers in both eyes. Anterior segment examination demonstrated bilateral chemosis, mild corneal edema, and markedly shallow central and peripheral anterior chambers. Gonioscopy revealed 360-degree angle closure (Fig. 1). Intraocular pressures were 33 mmHg in her right eye and 32 mmHg in her left eye. The patient stated that she had no previous need for optical correction. However, after initiating treatment with topiramate, her refraction was -7.50 diopters bilaterally. Topiramate was discontinued immediately. Antiglaucoma drugs (oral glycerine, oral acetazolamide and topical 0.5% timolol maleate) were administered to reduce the intraocular pressure, which quickly tapered. Topical 1% prednisolone acetate was started to reduce inflammation.

The patient reported symptomatic improvement by the third day after the discontinuation of topiramate. On the fifth day, visual acuity improved to

Correspondence to: Boonyaleephan S, Department of Ophthalmology, Faculty of Medicine, Srinakharinwirot University, 62 Moo 7 Rangsit-Nakhonnayok Rd, Ongkarak, Nakhon Nayok 26120, Thailand. Phone: 037-395-085, Fax: 037-395085 ext. 11303. E-mail: nujane8@hotmail.com

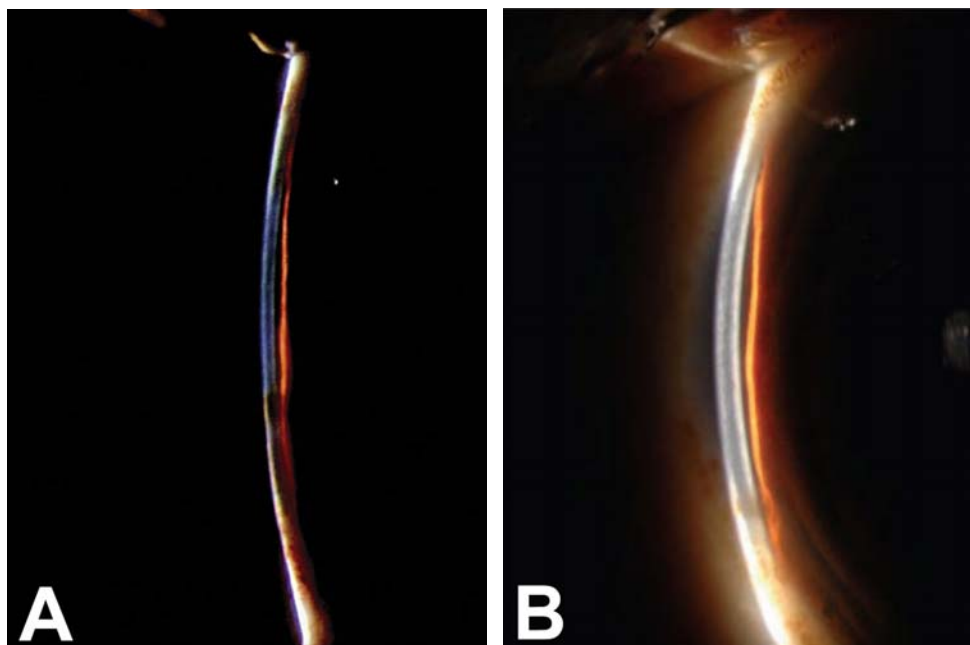


Fig. 1 Slit-lamp photography showing shallow peripheral anterior chambers in the right (A) and left (B) eyes after seven days of using topiramate

20/40 in both eyes with resolution of corneal edema. Intraocular pressure was 11 mmHg in both eyes maintained with only topical 0.5% timolol maleate. Examination showed deep central and peripheral anterior chambers (Fig. 2). Her refraction was -1.25 diopters bilaterally. Fundus examination showed cup to disc ratios of 0.3 in both eyes and was otherwise unremarkable.

Ultrasound biomicroscopy on the seventh day after the discontinuation of topiramate demonstrated no choroidal effusion in both eyes (Fig. 3). After two weeks, the BCVA was 20/20 in both eyes with no refractive error. Intraocular pressures and anterior chamber depth remained stable.

Discussion

There have been several reports of sulfamate-derived medications causing acute angle-closure glaucoma and myopia⁽²⁻⁴⁾. Drugs that contain sulfamate derivatives are generally found in two classes of medications: antibiotics and antihypertensives/diuretics. Recently, topiramate has been used as an oral medication for epilepsy and migraine⁽⁵⁾. It is a sulfamate-substituted monosaccharide that acts by predominantly inactivating the sodium gate channels, hyperpolarizing potassium currents, and activating GABA postsynaptic

receptors. In addition, it also weakly inhibits carbonic anhydrase. Topiramate is rapidly absorbed after oral administration, has a half-life of 24 hours, and is rapidly excreted in urine^(6,7). There have been several reports of topiramate associated acute angle-closure and myopia^(1,8-15). Most of the cases have been reported to occur within two weeks of starting topiramate^(1,12). Fraunfelder et al⁽¹⁶⁾ studied reports of ocular side effects of topiramate in 115 patients. Acute-onset glaucoma was documented in 86 patients (83 bilateral and 3 unilateral), and 17 cases had acute bilateral myopia of up to 8.75 diopters. Furthermore, nine patients developed suprachoroidal effusions.

In the presented case, topiramate was initiated for migraine prevention seven days before the onset of acute bilateral blurred vision, myopia, and angle-closure glaucoma. She was given a minimum therapeutic dosage of 25 mg daily, which suggests that the ocular side effects were not dose-dependent. Topiramate induced angle closure is an idiosyncratic reaction, and can occur in otherwise normal eyes with normal anterior chamber angles. Although the exact mechanism remains unclear, topiramate may be associated with ciliochoroidal effusion and forward displacement of the lens-iris diaphragm, resulting in acute myopia and angle-closure glaucoma⁽⁹⁻¹¹⁾.

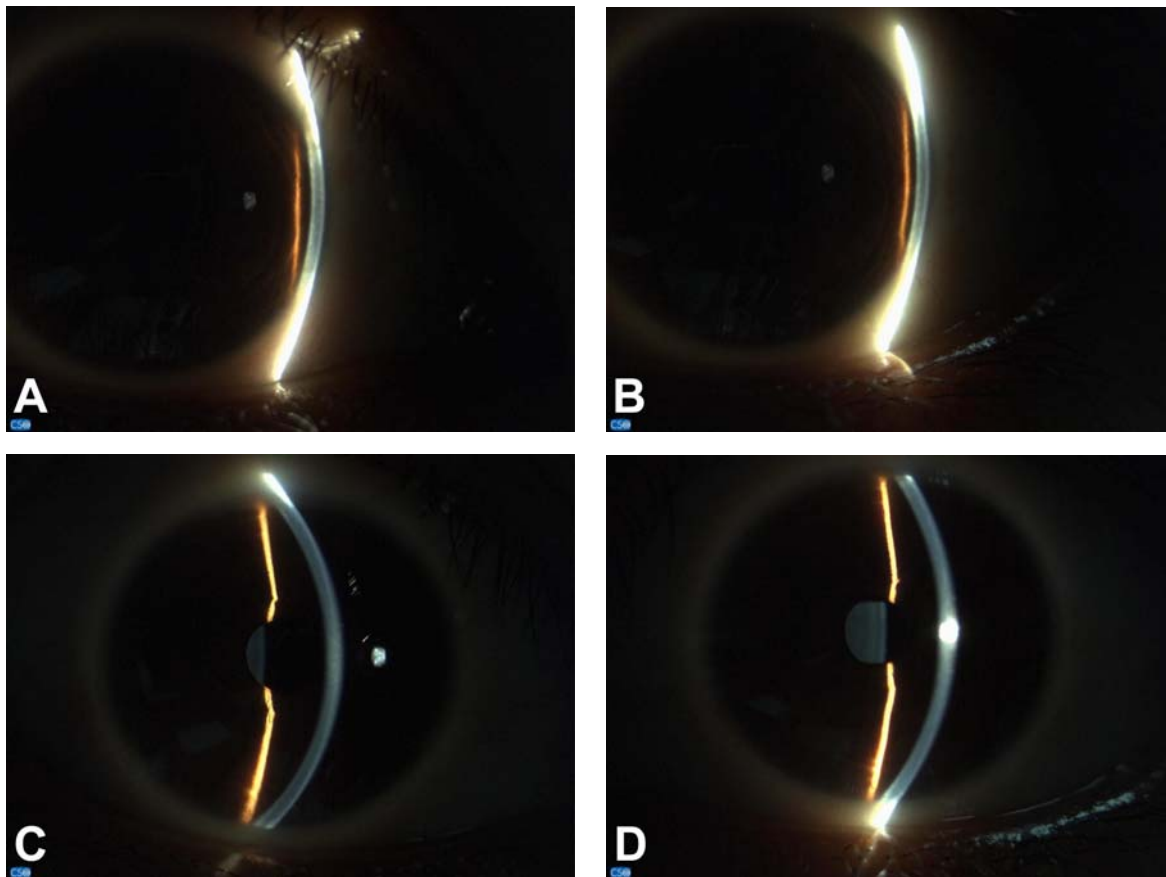


Fig. 2 Slit-lamp photography five days after discontinuing topiramate shows deep peripheral anterior chambers in both the right (A) and left (B) eyes. The central anterior chambers were of normal depth in the right (C) and left (D) eyes

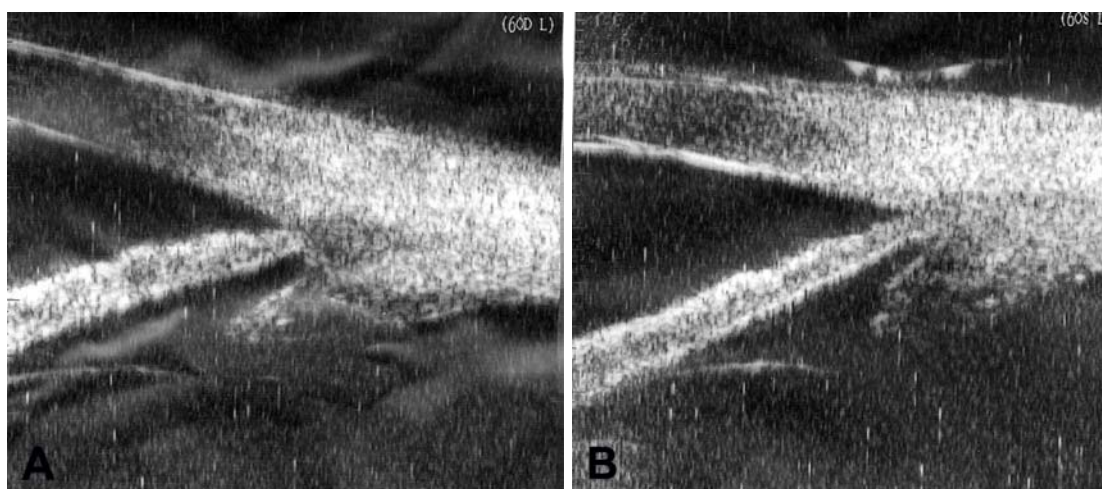


Fig. 3 Ultrasound biomicroscopy seven days after discontinuing topiramate shows no choroidal effusion both the right (A) and left (B) eyes

Treatment of this condition requires discontinuation of the medication and introduction of anti-glaucoma medications. Topical miotic drugs can lead to further narrowing of the angle and worsening of signs and symptoms^(8,17,18). Administration of topical 1% atropine may lower intraocular pressure by causing retraction of the ciliary process⁽¹⁰⁾. A peripheral iridotomy may not be helpful, as the precipitating mechanism is not pupillary block^(1,17).

The presented case was successfully managed by discontinuing topiramate and prescribing anti-glaucoma medications. To the author's knowledge, this is the first reported case of topiramate-induced bilateral acute angle-closure glaucoma and myopia in Thailand.

Conclusion

Topiramate use can result in acute bilateral angle-closure glaucoma and myopia, which are usually reversible when the drug is discontinued. Visual outcome is usually good and the episode resolves within a few weeks. Thus, it is important for the clinician to recognize these conditions and educate patients about these serious adverse effects when prescribing topiramate.

References

- Banta JT, Hoffman K, Budenz DL, Ceballos E, Greenfield DS. Presumed topiramate-induced bilateral acute angle-closure glaucoma. *Am J Ophthalmol* 2001; 132: 112-4.
- Bovino JA, Marcus DF. The mechanism of transient myopia induced by sulfonamide therapy. *Am J Ophthalmol* 1982; 94: 99-102.
- Krieg PH, Schipper I. Drug-induced ciliary body oedema: a new theory. *Eye* 1996; 10(Pt 1): 121-6.
- Hook SR, Holladay JT, Prager TC, Goosey JD. Transient myopia induced by sulfonamides. *Am J Ophthalmol* 1986; 101: 495-6.
- Silberstein SD, Lipton RB, Dodick DW, Freitag FG, Ramadan N, Mathew N, et al. Efficacy and safety of topiramate for the treatment of chronic migraine: a randomized, double-blind, placebo-controlled trial. *Headache* 2007; 47: 170-80.
- McNamara JO. Pharmacotherapy of epilepsies. In: Brunton L, Parker K, Lazo J, Buxton I, Blumenthal D, editors. *Goodman and Gilman's the pharmacological basis of therapeutics*. 11th ed. New York: McGraw-Hill; 2006: 501-25.
- <http://www.neurologyindia.com/article.asp?issn=0028-3886;year=2008;volume=56;issue=2;spage=204;epage=205;aulast=Dey-ft1> U.S. Food and Drug Administration. Topamax (topiramate) tablets prescribing information [homepage on the Internet]. 2003 [cited 2008 Mar 16]. Available from: <http://www.fda.gov/medwatch/SAFETY/2003/topamax.htm/>
- Chalam KV, Tillis T, Syed F, Agarwal S, Brar VS. Acute bilateral simultaneous angle closure glaucoma after topiramate administration: a case report. *J Med Case Reports* 2008; 2: 1-3.
- Craig JE, Ong TJ, Louis DL, Wells JM. Mechanism of topiramate-induced acute-onset myopia and angle closure glaucoma. *Am J Ophthalmol* 2004; 137: 193-5.
- Guier CP. Elevated intraocular pressure and myopic shift linked to topiramate use. *Optom Vis Sci* 2007; 84: 1070-3.
- Stangler F, Prietsch RF, Fortes Filho JB. Bilateral acute angle closure glaucoma in a young patient receiving oral topiramate: case report. *Arq Bras Oftalmol* 2007; 70: 133-6.
- Levy J, Yagev R, Petrova A, Lifshitz T. Topiramate-induced bilateral angle-closure glaucoma. *Can J Ophthalmol* 2006; 41: 221-5.
- Bhattacharyya KB, Basu S. Acute myopia induced by topiramate: report of a case and review of the literature. *Neurol India* 2005; 53: 108-9.
- Izambart C, Rocher F, Zur C, Chichmanian RM, Gastaud P. Topiramate and acute myopia with angle-closure glaucoma: case report and literature review. *J Fr Ophtalmol* 2007; 30: e11.
- Viet TH, Ravinet E, Schnyder C, Reichhart M, Guex-Crosier Y. Blood-brain barrier disruption associated with topiramate-induced angle-closure glaucoma of acute onset. *Klin Monatsbl Augenheilkd* 2006; 223: 425-7.
- Fraunfelder FW, Fraunfelder FT, Keates EU. Topiramate-associated acute, bilateral, secondary angle-closure glaucoma. *Ophthalmology* 2004; 111: 109-11.
- Panday VA, Rhee DJ. Review of sulfonamide-induced acute myopia and acute bilateral angle-closure glaucoma. *Compr Ophthalmol Update* 2007; 8: 271-6.
- Rhee DJ, Goldberg MJ, Parrish RK. Bilateral angle-closure glaucoma and ciliary body swelling from topiramate. *Arch Ophthalmol* 2001; 119: 1721-3.

ภาวะสายตาสั้นและต้อหินมุมปิดแบบเฉียบพลันทั้งสองตาหลังได้รับยาโทไปราเมต

สมาลี บุญยะสิทธิ์พรณ

วัตถุประสงค์: เพื่อบรรยายลักษณะภาวะสายตาสั้นและต้อหินมุมปิดแบบเฉียบพลันทั้งสองตา ซึ่งเกิดจากภาวะอื่นไม่พึงประสงค์ของยาโทไปราเมต

รายงานผู้ป่วย: ผู้ป่วยหญิงไทย อายุ 23 ปี เริ่มมีอาการตามัวลงมากทั้งสองข้าง หลังได้รับยาโทไปราเมต 7 วัน ระดับสายตาคือ เห็นที่ระยะ 1 ฟุต ทั้งสองตา ระดับความดันลูกตาคือ 33 และ 32 มิลลิเมตรปรอทในตาขวาและตาซ้าย ตามลำดับ นอกจากนี้ยังตรวจพบ ลักษณะเยื่อตาขาวและกระจกตาบวม ช่องหน้าลูกตาดำ มุมตาปิด และสายตาสั้น -7.50 ไดออปเตอร์ทั้งสองข้างอย่างเฉียบพลัน หลังหยุดยาโทไปราเมตและให้ยาลดความดันตา อาการดังกล่าวสามารถหายได้เป็นปกติ

สรุป: การใช้ยาโทไปราเมต สามารถทำให้เกิดภาวะสายตาสั้นและต้อหินมุมปิดแบบเฉียบพลันทั้งสองตาได้ และสามารถหายเป็นปกติได้ภายใน 2-3 สัปดาห์ ถ้าหยุดยาโทไปราเมต ดังนั้นแพทย์ควรตระหนักถึงภาวะนี้และควรแนะนำผู้ป่วยที่ใช้ยาโทไปราเมตว่าอาจเกิดภาวะอื่นไม่พึงประสงค์ได้
